ATOMIC ENERGY Newsletter

THE FIRST AND ONLY

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Dear Sir:

Certain facilities of the materials testing reactor, at the National Reactor Testing Station, have now been made available to research and industrial organizations who may wish to use the high neutron intensity obtainable at this reactor. This reactor space, which has now been made available, provides a higher neutron intensity than at the Argonne, Brookhaven, and Oak Ridge reactors. In addition, other portions of the reactor's greatest neutron intensity, which is used primarily for USAEC projects, may be available from time to time. All irradiations which are done at this reactor will be charged for at a rate based on depreciation, overhead, and operating expenses. Because of security needs, the actual work will be done by Phillips Petroleum Co., the prime contractor operating the MTR. Inquiries concerning details of irradiation services, scheduling, price lists, and arrangements for obtaining these services should be directed to Phillips Petroleum at Idaho Falls, Idaho.

The steam conditions under which the turbine of the nuclear power plant of Duquesne Light Company will operate are very different from steam conditions of a modern turbine-generator, W. E. Shoupp, Westinghouse atomic power division, recently explained at a Colorado Springs meeting of the Scientific Apparatus Makers Association. He observed that they will more closely resemble the steam specifications used in a 1908 model plant, than one of 1954. Westinghouse is making the reactor portion of the first U.S. central station nuclear power plant, which Duquesne Light is constructing and will operate. Mr. Schoupp mentioned that in this nuclear power plant some of the benefits of the highest thermodynamic efficiency do not have the same meaning that they do in conventional plants. In broad outline, he noted, the plant will consist of a reactor enclosed in a pressure vessel; a set of high pressure piping leading to a heat exchanger; and a secondary boiler and turbine generator system as in any conventional power station.

Privately financed atomic power plants will be competing, successfully, with conventional power plants in five to ten years, F. K. McCune, general manager, atomic products division, General Electric Co., told a panel discussion of the Atomic Industrial Forum, Inc., at a one day Forum conference last fortnight in Washington, D.C. He said it is G-E's opinion that this will be done without Government subsidy for production plant construction or operation. There will, however, be government-supplied fuel priced at cost-of-production levels. The reactors best suited for earliest and most effective competition with conventional fuel plants were described by Mr. McCune as a graphite-moderated water cooled reactor, and a light water-moderated and cooled boiling reactor. He said that the boiling reactor was chosen by G-E people in part because it is similar in many ways to conventional steam plants. Its adoption by the electric utility industry should be relatively easy, he stated. Mr. McCune noted that, according to G-E studies, this reactor could produce electrical energy for 6.7 mills per kilowatt hour.

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BUSINESS NEWS...in the nuclear field...

BIDS TO BE LET ON "PACKAGE" NUCLEAR POWER PLANT (PROTOTYPE): Invitations to bid on the design and fabrication of a prototype "package" nuclear power plant for military use will be issued about July 15th by the USAEC to those engineering firms and equipment manufacturers who have submitted proposals to handle the design and fabrication of such a plant on a lump sum, competitive bid basis. The closing date for such firms to submit their proposals had been extended from the original deadline of March 20th, to June 7th. A special contractor selection board has been appointed by L. R. Hafstad, the USAEC's director of reactor development, to review the proposals and work out the invitation to bid. The board is headed by J. J. Flaherty, manager of the USAEC's Chicago operations office, since it is this office which received the proposals, and which will award the contract and supervise the construction of the plant.

RISKS IN USE OF RADIOACTIVE MATERIAL OF CONCERN TO INSURANCE UNDERWRITERS: Instances of substantial use and occupancy losses, as a result of accidents involving radioactive materials, were cited by M. B. Dalton, president, Boston Manufacturers Mutual Fire Insurance Co., as an example of new risks insurers now must cope with. Mr. Dalton, who was speaking before an insurance conference of the American Management Association in New York last fortnight, mentioned that efforts of the fire insurance companies to properly handle radiation problems include a joint fire and marine insurance committee on radiation which he said has been working with the USAEC in a study of the problems involved. He observed that since there is a growing tendency toward policies that afford protection against loss from all causes with few exceptions and exclusions ("blanket policies"), and such policies cover radiation-caused losses, this is a factor now being taken into account by insurance actuaries in determining rates for such policies.

NEW CONTRACT LET FOR ADDITION TO URANIUM-ORE PROCESSING PLANT: A contract for an addition to the uranium ore-processing plant at Bluewater, near Grants, N. M., to treat sandstone gangue ores by an acid leaching process, has now been awarded Anaconda Copper Mining Co., by the USAEC. Work will start immediately, and is expected to be completed in about 18-months. (Since the opening of the first plant last Fall, which uses a carbonate leaching process successfully to treat limestone uranium ores, new and large bodies of uranium-bearing sandstone gangue ores have been discovered in the Grants area. Anaconda's contract provides not only for an addition to treat these newly-discovered ores, but also for the expansion of existing facilities and equipment to increase the capacity of the carbonate leaching output.)

RADIOISOTOPES...applications & notes...

Medical Uses Outlined: While only five of the 800 known radioisotopes have medical applications, thousands of patients have been helped by their use, Dr. Bernard Roswit, chief of the Radiotherapy Section, Kingsbridge Veterans Administration Hospital, New York, told a recent meeting of the New York Medical Society in New York. These radioisotopes finding medical uses are iodine-131; phosphorous-32; gold-198; strontium-90; and cobalt-60, Dr. Roswit explained, noting that they have helped patients with such conditions as advanced cancer of the thyroid gland, toxic hyperthyroidism, leukemia, and polycythemia vera. He observed that the difficulties of producing the desired radioactive elements or compounds in adequate quantity and strength, and in supplying these materials to the patient, must be overcome to expand medical uses of radioisotopes.

Radioisotopes in Sewage; Problems of Handling: Sewage sludge digestion is not impeded by radioactive phosphorous, iodine, and probably sulfur when they occur in concentrations normally expected in city wastes, J. C. Dietz, University of Illinois recently told the Ninth Industrial Waste Conference, at Purdue University. Dietz reported on experiments he and his coworkers conducted using concentrations from 10 microcuries to 200 millicuries per liter of wet sludge; these are levels many times higher than any expected to occur in normal city sewage. At the 200 millicurie level of phosphorous-32, a 17% reduction in gas production in laboratory batch digestion occurred, but at the 100 microcurie level, no inhibition was observed.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear lab and plant...

NEW PRODUCTS FROM THE MANUFACTURERS: New scintillation count rate meter, Model CRM-550, is offered by this manufacturer as a versatile instrument for use in a radioisotope laboratory. Features include a fast linear amplifier, which it is said, has a rise time of about one microsecond and an amplification of better than 100; and a true pulse height discriminator which is a stable biased, push-pull amplifier type that may be adjusted to accept pulses from 0-100 volts. The manufacturer also states that the high voltage power supply, which is variable from 700 to 2000 volts, is regulated to 0.005% change in output voltage per one volt change in line voltage between 95-and 130-volts. --Nuclear Research & Development, Inc., St. Louis 14, Mo.

Control equipment, for a low-cost experimental neutron chain reactor, now available for commercial use from this manufacturer of Oak Ridge National Laboratory design, the equipment is used on the so-called "swimming pool" reactor there. The control equipment consists of five signal channels: 1.- The counting rate channel, which begins recording before the control rods are withdrawn sufficiently for the reactor to be self-sustaining; 2.- The micro-microammeter channel, which, being the most precise, is normally used for holding the power level of the reactor constant during experimentation; 3.- The log n (or period) channel, to control the current to the reactor safety rods; 4.- The two safety channels. A safety feature in the design of the circuit is the extensive use of direct coupling in the concept of electronic circuitry, allowed voltage ranges, and monitoring provisions.--Radiation Counter Laboratories, Inc., Skokie, Ill.

Automatic flow counter (completely sealed), which accommodates up to 25 samples, makes possible automatic radioassays with a windowless Geiger or proportional counter. The unit keeps all samples under gas flow at all times, and accepts samples up to 1-7/8" D., and 5/16" high. Because of this feature (the manufacturer states) good accuracy and reproducibility are obtained without long pre-flush and excessive gas usage. The instrument may be set so that each of the samples is counted one, two, three, or four times, or so that the cycles are repeated indefinitely. The unit is said to have an overall accuracy of approximately 1% and a resolving time for Geiger counting of approximately 150 microseconds.--Tracerlab, Inc., Boston 10, Mass.

FROM NUCLEAR PLANT SUPPLIERS: Recently completed by the Berkeley, Calif., plant of U. S. Steel's Consolidated Western Steel division was the fabrication and heat treatment of long lengths of 36-in. diameter stainless steel pipe for severe corrosion applications at the Hanford Plutonium Works. Excessive distortion of the pipe, at the high temperatures required in the post-fabrication heat treatment, was successfully averted by development of special handling techniques. The 36-in. diameter pipe was made in 30-ft. lengths. Treatment of the pipe consisted of heating it to 1850-2050 deg. F., and holding it for 30-minutes, followed by a rapid quench in water. Kaiser Engineers sub-contracted this job to U. S. Steel.

Cellular glass insulating blocks, two inches thick, (trade-named "Foamglas") have now been installed as external insulation on the sphere (built for testing nuclear power plants for underseas craft) at Knolls Atomic Power Laboratory, near Schenectady, N.Y. The sphere, 225-ft. in diameter, is designed to minimize escape of fissionable material during testing work. Since the sphere is completely air-right, the insulation was necessary to maintain a constant temperature and hence constant barometric pressure in it, else hazardous stresses would be set up. The blocks were impaled on pins welded to the sphere, which is steel; the entire exterior was then covered by glass fabric membrane and a finish coat of asphalt cutback.

PEOPLE...in nuclear energy work...

John E. Gray, who has been director of the USAEC's technical and manufacturing division, Savannah River Operations (producing materials for atomic and thermonuclear weapons) has now resigned to join the atomic power division of Duquesne Light Co., Pittsburgh. Duquesne Light recently made arrangements with the USAEC to undertake the construction (with the exclusion of the reactor proper) and operation of the first U. S. full-scale central station nuclear power plant.

James G. Beckerley, for the last five years director of classification of the USAEC will leave Government service shortly.

RAW MATERIALS...radioactive mineral & ore development...

UNITED STATES: Grand Junction, Colo:- Some 100,000 acres of public land in New Mexico and Utah will be opened to uranium prospectors this June 14th, according to S. P. Wimpfen, manager of the USAEC's Grand Junction office.....Salt Lake City, Utah:- An increase in the capacity of Vitro Uranium Co.'s mill here will increase its uranium ore capacity by 50%; additions will be made to the mill's roasting units. Some $200,000 will be spent on the work in 1954, and $300,000 in 1955.....Washington, D.C.:- An increase in tax allowances for depletion in the mining of uranium has now been written into the tax reform bill by the Senate Finance Committee, which has been working on this omnibus measure. Under present law, miners of uranium are permitted tax deductions equivalent to 15% of their gross income from the operation. The new allowances would be 23%, as it has now been written into the bill.

CANADA:- An estimate that Nesbitt LaBine Uranium Mines would receive $20-$25 net per ton for stockpiled ore, which it will deliver to Eldorado Mining and Refining's custom mill this Summer, was made by president G. A. LaBine, at the company's annual meeting recently. Pointing out that Eldorado's custom mill is not yet ready to handle shipments of regularly mined ore, Mr. LaBine noted that this is development ore which is being delivered, and that this should not be construed as the grade of ore at the Eagle-Ace mine, in the Beaverlodge area, Northern Saskatchewan .....Initial drilling tests at the claims of Plum Uranium Mines, and Peach Uranium and Metal Mining, Ltd., are following up radioactive discoveries made during the course of initial surface prospecting, at ground representing some of the first uranium finds in the Blind River district, Ontario. Work by Plum will be in its 14-claim group in Lewis Twp., and its other holdings in the Algoma district and in the Espanola area. Drilling by Peach is to explore initially an area of good radioactivity discovered last Fall on its ground in Sheddon Twp.....At Centre Lake Uranium, where a three compartment shaft is being sunk, with an initial objective of 225-ft., the opening has reached a depth of 115-ft., the company states.

PERU:- Government geologists of this country's Atomic Energy Commission have reported "favorable indications of radioactivity in various localities", in this country. The Commission program encompasses not only such field work, but the training of selected Peruvian engineers and geologists in U. S. uranium exploration techniques. A chemical laboratory is also to be established.

INDIA:- The Singhbhum district of Bihar is receiving the attention of the Indian Bureau of Mines, with prospecting for uranium being undertaken there, according to the Indian Deputy Minister for Natural Resources and Scientific Research.

MOZAMBIQUE:- The 10% surtax levied on all exports of radioactive minerals is being continued here. The tax, which was started in 1951, has been extended annually since then, at this same rate.

NEW BOOKS & OTHER PUBLICATIONS,...in the nuclear field...

Engineering Development Problems in Atomic Power Plants, by G.S. Mikhalapov, et al (AECU-2755) 20¢...Metal High-Vacuum Manifold, by E. Paige (MLM-810) 20¢... Sodium Plumbing, by W.B. Cottrell & L.A. Mann (ORNL-1688) 60¢...Utilization of Gross Fission Products, by G.A. Young (TID-3046) 25¢...Office of Technical Services, Wash. 25, D. C.

Radiometric Assay of Uranium and Thorium Ores, by E. Franklin and R.K. Barnes. Work done at Atomic Energy Research Establishment, Harwell (England).--British Information Services, New York 20, N.Y. ($1.90)

NUCLEAR WORK ABROAD...news & notes...

UNITED KINGDOM: The extensions to the Radiochemical Center at Amerisham, recently dedicated, which are part of the expansion plan for this operation, (to eventually provide eight new buildings) now enable increased activities. Amerisham Director Patrick Grove, explaining the work there, said that technical progress at Amersham in the past five years had been along two main lines: chemical engineering in miniature, with emphasis on improved remote control mechanisms; and the diversification of radioactive sources supplied. He pointed out that in 1953 the value of radioactive products supplied from Amersham exceeded $3 million, with about one-third of the sales exported. The isotopes in greatest demand for medicinal purposes are iodine-131, and phosphorous-32, he said. A production unit for gold-198 is now under construction.

ATOMIC PATENT DIGEST...recent U. S. grants in the nuclear field...

Radiation detector. Comprises (in part) a cathode array including several wafer-like elements stacked together with their surfaces separated and in co-extensive relationship. An anode within the array receives charged particles escaping from a plurality of these elements, and an auxiliary anode adjacent to the outside of this array receives particles escaping from there. U. S. Pat. No. 2,677,780 issued May 4th, 1954; assigned to Texaco Development Corp., New York. (Inventors: H.V. Rees and A.L. Tirico).

Capping machine for seaming a cap onto a receptacle without using an upper chuck. Comprises (in part) a support for rotatably supporting a receptacle with cap to be seamed with means overlying the receptacle comprising at least three rollers each having an upper flange, and so located that their peripheries may engage the sides of the cap. The rollers may be coupled together to rotate the receptacle and cap while seaming pressure is being simultaneously exerted against the cap by one of the rollers. U. S. Pat. No. 2,678,014 issued May 11th, 1954; assigned to United States of America (USAEC). (Inventor: M.B. Hawkins.)

Activated uranium dioxide and process of producing it. The process comprising (in part) reducing uranium oxide with a methane-containing gas at a temperature within the range 400-500 deg. C. U. S. Pat. No. 2,678,257 issued May 11th, 1954; assigned to United States of America (USAEC). (Inventor: M.J. Polissar.)

Means for controlling flow of electrolyte to an electrolytic cell. In a system whereby an electrically conducting fluid is superimposed upon a fluid of a different electrical conductivity, to form a boundary between them, means for causing an electrolysis current to flow in these fluids to heat the fluids to a temperature inversely related to their respective conductivities. An electrical resistance unit is in the fluids in the region of the boundary between them. A container holds an additional supply of one of the fluids, and provision is made for controlling the flow of fluid from the container to the system. U. S. Pat. No. 2,678,300 issued May 11th, 1954; assigned to United States of America (USAEC). (Inventor: J.M. Sturtevant.)

Method for producing alkyl substituted amine borines, containing not more than 12 carbon atoms. Comprises (in part) heating a quaternary ammonium borohydride to a temperature above 150 deg. C., to decompose the quaternary ammonium borohydride and form a vapor comprising alkyl substituted amine borine and a hydrocarbon. U. S. Pat. No. 2,678,949 issued May 18th, 1954; assigned to United States of America (USAEC). (Inventors: M.D. Banus and T.R.P. Gibb, Jr.)

Mechanical register, pulse actuated. Comprises (in part) the combination of a magnetically permeable, peripherally circular rotor supported on a shaft, in a housing, the rotor having figures inscribed around its periphery, an electromagnet having the poles disposed diametrically of this rotor, and a permanent magnet of less field strength and having the poles disposed diametrically of this rotor. The axis of the poles of the permanent magnet is so angularly displaced with respect to the poles of the electromagnet that the greater attraction of the dipole produced across the rotor by the electromagnet for the poles of the permanent magnet, causes rotation of the rotor. U. S. Pat. No. 2,678,773 issued May 18th, 1954; assigned to United States of America (USAEC). (Inventor: W.E. Glenn, Jr.)

Ion source. An electronic discharge device (in an arc source for producing ions) comprising (in part) an anode, a first and second thermionically emissive electrode, starting means for initially heating at least one of the electrodes to an electron emissive temperature, means for producing an arc discharge between one of the electrodes and the anode, and means for introducing into the region of the arc discharge a vapor of the material to be ionized. U. S. Pat. No. 2,679,597 issued May 25th, 1954; assigned to United States of America (USAEC). (Inventor: C.M. Turner.)

Sincerely,

The Staff,
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